U.S. DEPARTMENT OF ENERGY
ENERGY

Across The Pond

A Quarterly Update on Joint UK NDA/US DOE Activities and Initiatives
Issue 2: December 2009

NDA
Nuclear Decommissioning Authority

Environmental Remediation and Radioactive Waste Management Conference ICEM'09

ICEM09

Albert Docks, Liverpool UK

DOE - NDA relationship recognized at International Environmental Cleanup Conference

The ICEM '09 conference held in Liverpool, UK Oct 10-16th drew participants from all over the world including a high-level presence from DOE's Office of Environmental Management (EM).

Dr. Samit K. Bhattacharyya, Laboratory Director, Savannah River National Laboratory, gave an opening session presentation on behalf of Dr. Inés R. Triay, Assistant Secretary for Environmental Management, who at the last minute was unable to participate. The presentation highlighted the EM program mission, priorities and its international program, specifically recognizing the importance of the NDA-DOE relationship. NDA Chairman Stephen Henwood's opening session talk also acknowledged the importance of the relationship.

Ana M. Han, EM's Lead Foreign Affairs Specialist, presented a paper on efforts being conducted under the Statement of Intent between the DOE and the NDA, as well as discussing EM's future international activities. Both presentations were well received with keen interest being expressed on contributing to the information sharing exchange currently being undertaken by EM and the NDA on: Hot Isostatic Pressing; Ion Exchange Resins; including Transportation, Packaging, and Disposal; Deactivation and Decommissioning (D&D) in Confined Spaces; Decommissioning Hierarchy issues; Glass Chemistry; Tank Corrosion Monitoring and Structural Integrity Issues; and Fuel Drying.

NDA - DOE Standing Committee Meeting commends progress

The 5th NDA and DOE-EM Standing Committee meeting was held on the margins of the ICEM'09 Conference in Liverpool, UK, October 14, 2009. DOE-EM representatives met with their NDA counterparts in support of the 2007 Statement of Intent for management of radioactive waste, and decommissioning and cleanup of nuclear installations. The agenda focused on updating the Standing Committee members on technical discussions related to fuel drying, glass chemistry, decontamination and decommissioning, and human capital and strategic planning. Participants were briefed on the recent EM re-organization. Both sides recognized the importance on the information exchange leading to tangible

results in the cleanup efforts and promoting the sharing of lessons learned. In addition, both sides agreed to hold the 6th Standing Committee meeting at Savannah River National Labs in March 2010 around the time of the Waste Management Conference in Phoenix, Arizona.

Participants at the 5th standing committee (left to right; Graham Jonsson, Mark Gilberston, Adrian Simper, Randall Bargelt, Jack Craig, John Mathieson, Ana Han, John Inkester, Samit K. Bhattacharyya)

Topic Area Update: Significant Progress Being Made

Following identification by DOE and NDA of a number of mutually agreeable areas for further discussion, a total of nine detailed topic area calls have been conducted between interested parties in technical areas including Hot Isostatic Pressing, Ion exchange resin transportation and disposal, D&D technologies and approaches, Glass chemistry and Fuel drying. The calls were attended by technical experts from the DOE and NDA as well as Site Contractors and National Lab personnel. A wealth of technical knowledge has been shared in these calls and it is becoming much clearer as to which topic areas lend themselves better to the development of joint R&D and technology development programs and which are best managed as focused information exchange fora. Of particular note has been the effort in Glass Chemistry where five key areas of potential joint R&D have been identified (see separate article).

Topic Area	Number of Calls Held	Topic Area Leads	Summary of key information discussed
Fuel Drying	2	Paul Gilchrist - UK NDA Bill Hurt - INL	•USDOE has much more experience in fuel drying than UKNDA but there are common technical issues which need to be discussed on a peer-to-peer level, possibly in a workshop format.
Glass Chemistry	2	Kurt Gerdes – DOE Jim Marra – SRNL Carl Steele – Sellafield Ltd	•While both countries' wastes are somewhat different in their constituents, common issues remain such as spinel formation and glass additives which lend themselves to joint efforts.
Hot Isostatic Pressing	2	Steven Ross – DOE Graham Jonsson – NDA	•The demonstration of HIP at a full scale for Pu residues is ongoing in the UK •The use of HIP at a full scale in the US for calcine residues is still some way from becoming a reality.
D&D	2	John Inkester – NDA Andy Szilagyi - DOE	•A number of technologies and approaches are being investigated to solve common D&D problems •Existing approaches being used in both the US and the UK are being considered for similar applications in the other country.
IX Resin disposal and transportation	1	Graham Jonsson – NDA Christine Gelles - DOE	•Management of NDA resins is more akin to power generating industry in US than it is to DOE management of resins which tends to be on-site disposal

Topic Area Update Table

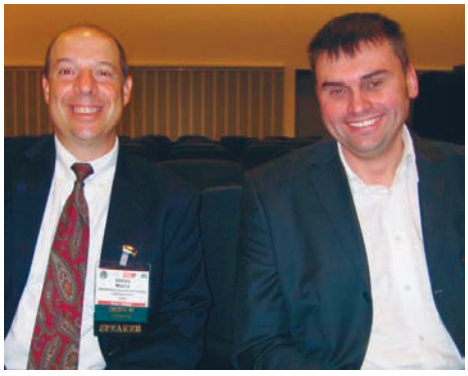
Information Exchange is one of "DOE's best business practices"

DOE EM Assistant Secretary, Dr Ines Triay participated in a radio interview with the IBM 'Business in Government' hour on CBS radio in late October. Of particular note in her responses to a series of tough questions was that concerning International Collaboration. She explained that the best example, in her opinion, was the relationship with the NDA since many of the contractors in the US also work in the UK and that these interactions are essential to benefit both Government cleanup programs.

To hear the full interview go: http://www.businessofgovernment.org/interviews/profile/index.asp?PID=382

Glass Chemistry – A Flagship of Progress Under the Statement of Intent

One of the objectives of the Statement of Intent between the DOE and the NDA is to identify technology areas where the two Governments can leverage off one another's activities and also to develop and participate in joint R&D and Technology Development activities. Both countries have ongoing and planned activities in vitrification for long term stabilization of radioactive waste. The US has had an operational facility at Savannah River (DWPF- Defense Waste Processing Facility) for more than 13 years with new waste types being introduced over that time period and are currently in the design and construction phase of the Waste Treatment Plant at Hanford for both high level and low level wastes. The UK has been operating vitrification at Sellafield since 1991 and has successfully produced more than 5,000 HLW canisters in that time.



Jim Marra (Savannah River) and Carl Steele (Sellafield)

However, despite this wealth of experience and know-how, as new wastes are identified and performance improvements are required, the need for better glass stabilization matrices becomes more and more essential. With this is mind, the parties responsible for development of glass chemistry for long term stabilization of wastes have been sharing information and developing plans for joint programs. The parties, which include representatives from PNNL (Pacific Northwest National Laboratory), SRNL (Savannah River National Laboratory), Energy Solutions, Vitreous State Laboratory, Sellafield Ltd,

DOE and NDA have identified five key areas for future collaborations in the short term, namely;

1. Spinel formation in Glass - Even though the waste compositions across the DOE complex, and those in the UK are different - the US has high aluminum and iron contents whereas the UK has lower levels of those but higher concentrations of rare elements such as Mg, Sr, Ba, Cs and Mo - there are still similarities in terms of issues relating to spinel formation in the glass (a change in chemistry creating blockages) and the impact of these on processing. Therefore, one area of collaboration being developed is in the kinetics of spinel formation the role of nucleating agents and chemical composition effects on long term waste performance and wasteform development.

2. Melting behaviour - An understanding of glass melting behaviour is a key factor in optimizing glass processing and throughput. The UK and US have common interests in the thermodynamics and kinetics of glass batch reactions, effect of melter parameters such as agitation and temperature on glass melting, and modelling of the glass melting process.

3. Advances in glass composition - Advances to current borosilicate glass compositions such as identifying additives to improve processing and/or properties for particular isotopes are also of common interest. Moreover, identification of alternative glass compositions (such as phosphate glasses) which could provide transformational improvements to waste vitrification or specific use for challenging waste streams are being considered.

4. Alternative melter technologies - Although the UK is committed to its current melter system for processing high level waste, consideration is being given to alternative melters for intermediate level waste. In this case, well known alternatives such as cold crucible, Joule heated ceramic-lined or in container vitrification are being considered. Since the baseline technology for US vitrification processes is the Joule heated ceramic-lined melter there is considerable knowledge to be shared.

5. Waste glass performance - The environmental performance of glass waste forms is of interest to both countries as questions regarding long-term repository disposition of waste forms continue. Specifically, there is joint interest in fundamental mechanisms of waste glass corrosion, test methodologies to study glass corrosion and modeling of long-term performance.

Through the regular Topic Area calls, these areas of interest will be formulated into joint programs of work in the coming months.

vitrified waste product

US Nuclear Waste Technical Review Board visit UK

The NDA hosted a visit by the US Nuclear Waste Technical Review Board (NWTRB) in early November. The Board provides technical oversight of the U.S. Department of Energy's efforts to develop long-term management approaches for high-level radioactive waste and spent nuclear fuel. The Board is appointed by the President on the recommendations of the U. S. National Academy of Sciences.

NWTRB

The Board met with the Radioactive Waste Management Directorate (RWMD), responsible for implementing geological disposal in the UK, who are located at Harwell in Oxfordshire. Ten out of 11 of the Board members were on the trip, along with four technical support staff. They gave a presentation to the RWMD team on their responsibilities which was followed by a lively Q&A session which inevitably included questions about Yucca Mountain. In return, specialists from RWMD gave a number of presentations covering site characterisation, safety case preparation (transport, operational, post closure), waste packaging approval process and the needs driven approach to R&D. This again gave rise to a number of deeper discussions on between the Board and RWMD.

The Board then travelled to Cumbria and were given a tour of the THORP reprocessing plant at Sellafield and held discussions with senior NDA and Sellafield staff on reprocessing and decommissioning experiences. While in Cumbria, the Board also met the West Cumbria Partnership, a grouping of two local borough councils and the county council, which have expressed an interest in hosting the deep geological repository. The Board finished their UK tour in London and held meetings with the Committee on Radioactive Waste Management (CoRWM), an advisory group to government, and with officials from the Department of Energy and Climate Change (DECC) responsible for waste management policy. The Board also met with officials from the Department for Transport.

Bruce McKirdy, the Acting RWMD Director said, "We were delighted to host the visit by the Board. We have had a long association with them and it was interesting and informative to exchange views on a number of technical subjects of common interest."

John Garrick, Chairman of the Board said

> ***"We found the whole UK experience to be very interesting and informative. The UK seems to have got its geological disposal programme moving again, which shows these things are not impossible. We wish them well."***

M3 test rig

Visit from Senior Sellafield Ltd staff to Hanford considered a 'Great Success'

M3 test rig for validating mixing performance in the Waste Treatment Plant (WTP)

A Senior level team from Sellafield Ltd comprising Dorothy Gradden, Paul Stewart and Cliff Birchall visited the Hanford site recently to hold an informal technical exchange with DOE and contractor personnel on sludge retrieval, mobilization, sampling and treatment issues. Their discussions included meetings with DOE Office of River Protection, Washington River Protection Solutions and Bechtel National Inc and also included a tour of the M3 Mixing Test Platform which has been purpose-built at Mid Columbia Engineering to trial mixing systems and configurations for the Waste Treatment Plant.

During the visit, it became clear that whilst there are some different challenges and approaches in both organizations, there are also many areas of common technical interest and common problems being addressed. As a result, sludge/slurry related issues has been suggested as an additional area of focus under the Statement of Intent and is being considered for 2010.

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